



DECISION MAKING IN AVALANCHE TERRAIN

AVALANCHE RESCUE

Student Handbook



The Student Handbook for The AIARE Risk Management Framework
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Special thanks to the AIARE Education Committee and others for their invaluable contributions to the development of *The AIARE Risk Management Framework* and this companion manual: John MacKinnon, Ben Pritchett, Howie Schwartz, and Margaret Wheeler.



Avalanche Research + Education

AIARE's mission is to "Save lives through avalanche education."

AIARE is a registered 501(c)(3) nonprofit educational organization, which serves as a focal point for the gathering, development, and dissemination of materials, ideas, and curriculum for avalanche educators in the U.S. and select locations across the world. There are currently over 110 course providers and 450 instructors representing AIARE. This handbook was created with input from this community. AIARE is comprised of an advisory Education Committee and professional staff charged with assimilating ideas, materials, and concepts from AIARE members and the avalanche industry to develop teaching tools and materials.

AIARE does not teach, oversee or conduct AIARE 1, AIARE 2 or Avalanche Rescue Courses. It does provide course curriculum and materials to avalanche course providers and qualified instructors to teach AIARE 1, AIARE 2, and Avalanche Rescue courses. All organizations and individuals conducting AIARE act independently of AIARE and are solely responsible for conducting the courses.

Importantly, in choosing to voluntarily engage in avalanche courses or program that operate in the backcountry and/or wilderness settings, individuals must understand that they accept and assume the inherent risks of these activities.



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This manual that provides a detailed explanation of each step outlined on the AIARE Avalanche Rescue Quick Reference card provided on this Avalanche Rescue Course. This manual is an excerpt from the student handbook for the AIARE 1 and AIARE 2 courses.

Avalanche Rescue is a part of the three course program Decision Making in Avalanche Terrain. Take an AIARE 1 course to learn how to use a backcountry risk management process. Take an AIARE 2 to get coaching on how to apply that process to new situations. Take an Avalanche Rescue course regularly to keep your rescue skills sharp.

MANAGE YOUR AVALANCHE RISK

Consider your motivation to access backcountry winter terrain. Is it to glide up the skin track and reach untouched powder skiing? To snowshoe throughout the winter on your favorite summer trails? To head deep into mountainous terrain on a snowmobile? Or to leave the lift lines behind and exit the ski area from a backcountry gate?

There are endless recreational opportunities in the backcountry, but regardless of your mode of travel, these pursuits all involve risk.

Some risks, such as the cold and the complexities of backcountry navigation, are easier to understand and manage. Other risks, like those posed by avalanches, are much more complex.

Additionally, the consequences of involvement with an avalanche can be deadly. Because the stakes can be so high, staying safe in the backcountry requires humility, methodical assessments, unbiased decision making, and a lifelong dedication to learning about avalanche terrain and the conditions that cause an unstable snowpack.



Grant Gunderson



Chris Pruden

The first step for both you and the people you travel with into the backcountry is to begin your avalanche education. The AIARE program *Decision Making in Avalanche Terrain* is an introduction to a mentored practice that engages backcountry travelers in the lifelong learning process that is an essential part of backcountry recreation. *Decision Making in Avalanche Terrain* introduces backcountry travelers to a repeatable risk management process, *The AIARE Risk Management Framework* or *The AIARE Framework* for short. *The AIARE Framework* helps a team work together to manage avalanche risk and make decisions in avalanche terrain. This program consists of three courses:

AIARE 1

The objective of the AIARE 1 is to learn how to recognize risk in avalanche terrain. This three-day course provides an introduction to using *The AIARE Framework* to manage risk while traveling in avalanche terrain.

AVALANCHE RESCUE

Avalanche Rescue is a one-day intensive course to learn how to manage a small-team avalanche rescue. This course also serves as a regular refresher opportunity to practice seldom-used skills.

AIARE 2

The objective of the AIARE 2 is to learn how to manage uncertainty in avalanche terrain. This three-day course is for those who have taken an AIARE 1, Avalanche Rescue, and have had at least one year of backcountry travel experience. The AIARE 2 provides backcountry coached mentorship in the application of *The AIARE Framework* to new terrain and situations.



Chris Pruden

PRACTICE AVALANCHE RESCUE



Grant Gunderson

Getting caught in an avalanche can be violent, gruesome, and heartbreaking. On average, 53% of fully buried victims die. The chance of surviving a complete burial decreases significantly after 10 minutes. In North America, the chance of survival in an avalanche is further reduced by the increased incidence of major trauma. In fact, one quarter of avalanche fatalities are due to traumatic injuries, not from asphyxiation.¹ The odds aren't good. The best plan is to do everything possible to avoid involvement with an avalanche.

Using *The AIARE Framework* can help your group make good decisions in avalanche terrain and avoid involvement with an avalanche. But traveling in the backcountry is not without risk. Groups can make mistakes in judgment or decision making. If someone from your party is buried in an avalanche, the victim has only minutes before they'll succumb to asphyxia. This means outside help is not an option and the buried partner is relying on you for rescue.

1 From 25 years of Canadian and Swiss statistics on people completely buried in an avalanche. Haegeli, P., M. Falk, H. Brugger, H.-J. Etter, and J. Boyd. "Comparison of Avalanche Survival Patterns in Canada and Switzerland." *CMAJ: Canadian Medical Association Journal* 183, no. 7 (2011): 789-95. doi:10.1503/cmaj.101435

If the victim is fully buried, consider the following. A three-foot deep burial (which is less than average) requires moving at least 2,500 pounds of snow. A six-foot deep burial requires moving at least 10,000 pounds of snow. Responders have minutes to get the job done, and still have the confounding factors of keeping the rescuers safe, the challenges of communication and access to the debris (with people potentially spread across a mountainside), understanding the technical detail of the transceiver, and the overwhelming stress of having a partner dying beneath the snow. If it is not clear yet, avalanche rescue is not something you want to ever have to do.

Practicing avalanche rescue is rehearsing for an unlikely but possible emergency situation. Learn how to best conduct an avalanche rescue by taking an Avalanche Rescue Course. To keep your skills sharp and make sure you are reinforcing the correct habits, frequently review this avalanche rescue section, practice throughout the season, and regularly retake the Avalanche Rescue Course to gain experience working with others in realistic scenarios and receive coaching from experienced professionals.

There are three areas to cover every time you practice avalanche rescue:

- How to respond if caught in an avalanche
- How to organize avalanche rescue with teammates
- How to care for and evacuate an injured party from the backcountry

It is also important to evaluate your avalanche rescue skills to make sure that you are reinforcing correct habits and continuing to improve skills you may infrequently use. You want to be able to employ your skills efficiently and as quickly as possible. As noted earlier, the chance of survival decreases significantly after 10 minutes. Timing your practice gives you an indication of how effective your skills would be in a real-life response situation. Practice and time your skills to ensure you are able to recover a target buried at least three feet deep in 10 minutes or less.

The bottom line is that avalanche rescue is a daunting and challenging task. The upside is that training can improve response outcomes. As an example, the highly-trained guides of heli-ski company Canadian Mountain Holidays have an average response time of 8 minutes. That skill and efficiency comes from regular practice and training.



Mike Manuel



Grant Gunderson

HOW TO RESPOND IF CAUGHT IN AN AVALANCHE

One of the most important aspects of emergency rescue scenarios is taking care of your own safety first. You are no good to the rescue effort if you are also a victim. Prepare for the worst and know what to do if you are the victim in an avalanche. If you notice the slope beginning to slide, get to safety if possible and then look for the rest of your party.

If you feel yourself getting caught:

- Yell! Call out for attention.
- Your backcountry partners should always have eyes on the person exposed to the avalanche hazard. If your team can establish a last point seen, it will improve your chances of being found quickly.
- Deploy your airbag.
- Don't hesitate to do this. The airbag will not affect your ability to yell or exit to the side of the avalanche.
- Try to exit to the side of the avalanche.
- Slide or roll towards the sides of the avalanche. Snow moves more slowly at the edges of the avalanche and you increase your chances of not being carried as far.
- Try to arrest as you're caught.
- If you fail to escape to the side of an avalanche, grab bushes or trees, or arrest yourself in the bed surface in an effort to slow yourself down. This might allow the moving snow to flow around you and leave you high on the slope.

As the momentum of the avalanche accelerates:

- Discard your equipment.
- Release your skis or snowboard if you can, let go of your poles, and continue to fight and thrash your way to the side of the avalanche.
- Protect yourself.
- Keep your backpack on; it protects your spine and you may need the gear inside during the rescue. If there is no hope of getting to the side of the avalanche, curl into a ball and keep your arms and legs tucked in to protect yourself. Keep your hands in front of your face to protect your airway.

As the snow slows:

- Fight to get to the surface.
- Thrust or kick towards the surface. Your chances of survival increase if you are only partially buried. Try to clear an air pocket in front of your face.
- Try to dig out.
- When the snow stops moving, try to dig yourself out if possible. If you're fully buried and can't move, try to remain calm and slow your breathing.
- Yell to rescuers if you can hear them.
- Remain calm.
- Whatever happens, try to remain calm. As difficult as it sounds, try to slow your breathing to conserve the air in your air pocket.

HOW TO ORGANIZE AVALANCHE RESCUE WITH TEAMMATES

Have the Right Gear and Know How to Use it

The first step of any rescue response is to have the proper equipment and to know how to use it. The basic required equipment for each backcountry traveler includes an avalanche transceiver, probe, shovel, and a communication device with which to contact outside help. These essential tools facilitate the search and rescue of avalanche victims. You should also carry your *AIARE Fieldbook* or *AIARE Rescue Quick Reference Card* with you at all times and use it throughout the rescue process—both when practicing and during an emergency.

Your essential equipment—transceiver, shovel, and probe—can save your life or your group member's life, so it must be in good condition. Whether you own or rent one, your transceiver should be a digital model with three antennas. Purchasing a used transceiver is not recommended, as they are fragile electronic devices requiring care and maintenance. Know the history of your own device: how old it is, if anyone has borrowed it, and when the firmware was last updated. Refer to the user manual for details specific to your transceiver and don't forget to check the battery level each time you enter the backcountry.

Know how to properly wear your transceiver. Keep in mind electronic devices such as cell phones, cameras, radios, and even battery-heated electric gloves can impair your transceiver's ability to transmit or search. Keep these devices at least 30 cm (12 in) away from your transceiver while traveling in the backcountry. Turn off all electronic devices, including phones, digital cameras, and snowmobiles prior to beginning a search.

Additional safety equipment includes airbag packs, Avalung® equipment, and gear with RECCO® technology. An avalanche airbag is designed to reduce the likelihood of burial. According to Swiss statistics from accidents between 1981 and 1998, the most effective means of preventing fatality in an avalanche accident is to avoid complete burial. This study showed that the overall buried victim mortality rate is 52%, but the partly buried victim mortality rate is only 4.2%.² Avalanche airbag packs and vests are designed to prevent or decrease burial depth, potentially decreasing the chance of mortality. A secondary, but still important, factor to note is that avalanche airbag packs may reduce the chance of trauma. Depending upon the location of the inflated airbag (back, head/neck, or chest) certain types of impacts may be lessened. A helmet and body armor may work with an avalanche airbag to further reduce trauma. An important consideration is that an avalanche airbag pack is not guaranteed to prevent burial, so a transceiver, probe, shovel, and partner are still considered essential equipment regardless of whether an airbag is used.

An Avalung® is designed to help a fully buried victim maintain an airway beneath snow and slow the accumulation of carbon dioxide in the victim's breathing space. Gear and clothing equipped with a RECCO® reflector can make a buried victim easier to find by professionals with the necessary search equipment. The reflector is not a substitute for an avalanche transceiver, probe, and shovel. When someone is buried, it is the combination of the transceiver and reflector that give buried victims the best opportunity to be found faster, whether in a ski area or far in the backcountry.

Adequate clothing and extra insulation, first aid, and an emergency evacuation sled increase the chance of surviving injury and facilitating first aid and evacuation once the recovery has happened.

Conduct a transceiver function check every time prior to entering the backcountry. Assemble your probe and shovel before every trip to ensure everything is working and in order. Each season deploy and repack your airbag according to the manufacturer's recommendation to verify it is functioning properly.

2 Brugger, H., Falk, M. "Analysis of Avalanche Safety Equipment for Backcountry Skiers." Translation of a paper from JAHRBUCH (2002). Published by the Austrian Association for Alpine and High Altitude Medicine. Retrieved from https://s3.amazonaws.com/BackcountryAccess/content/papers/brugger_falk_report_2002.pdf

Small-team avalanche rescue

Small-team avalanche rescue isn't simply practicing with your transceiver, probe, and shovel. It is important to learn not only how to use your equipment, but also how to execute all the components of a rescue under pressure, including taking in the overall scene, making a plan for how to allocate resources, and considering how you will connect to outside help.

AVALANCHE RESCUE QUICK REFERENCE

-CALL FOR HELP; DO NOT LEAVE SITE-

- ☑ **STOP. ASSESS SAFETY! ENSURE NO FURTHER HAZARD**
 - Risk of a second avalanche?
 - Move to defined safe location
- ☑ **CHOOSE A LEADER**
 - Delegate tasks
- ☑ **HEAD COUNT**
 - How many missing?
- ☑ **CALL FOR HELP (911)**
 - Location, Nature of Emergency, Name, # in group, # missing
- ☑ **SWITCH ALL TRANSCEIVERS TO SEARCH MODE**
 - Check that no transceivers are transmitting
- ☑ **DETERMINE WHERE TO SEARCH**
 - Below POINT LAST SEEN
 - In line with clues
 - Areas of debris, especially terrain traps
- ☑ **SEARCH FOR SIGNAL & VISUAL CLUES**
 - Enter debris from side or toe of path
 - Search strips 40m apart (~40 strides)
- ☑ **YELL TO OTHERS WHEN YOU FIND A CLUE OR RECEIVE A SIGNAL**
 - Pull clue out of snow and leave on snow surface
 - Put a marker in the snow where you begin to follow signal
 - Call for a second searcher to assemble probe and shovel

- ☑ **FOLLOW SIGNAL TO BURIAL AREA**
 - SLOW AND PRECISE as you approach 10m
 - Keep transceiver near the snow surface during final approach
 - Around 5m, place a marker on the snow that points along the approach trajectory
- ☑ **LOCATE BURIAL WITH TRANSCEIVER & PROBE**
 - If possible, 2nd searcher PROBES LIKELY BURIAL AREA in front of transceiver searcher's trajectory until closest signal located
 - Locate the closest transceiver signal by bracketing ahead/behind and to the sides, maintaining consistent transceiver orientation
 - Pinpoint using the probe, from the center of the closest signal, outwards in a circular pattern
 - Probe strike = victim location LEAVE PROBE IN PLACE!
- ☑ **SHOVEL FAST & EFFECTIVELY**
 - Start with a large step downhill and away from the probe, 2 or more steps if deep burial
 - Dig towards the probe; throw snow far away!
 - CHANGE SHOVELERS OFTEN (if rescuers available)
 - Careful shoveling as you reach your buried companion
 - Expose face immediately
- ☑ **PATIENT CARE**
 - Clear airway
 - Provide First Aid or CPR as required
 - Move to safe terrain
 - Plan evacuation and follow up on call for help
- ☑ **IF HELICOPTER COMES TO YOUR AID**
 - Secure loose items so they do not blow away
 - When heli lands, wait for rescuer to come to you

FIGURE 1: AIARE AVALANCHE RESCUE QUICK REFERENCE

There is too much happening in the moment to try to remember all the things you need to do. Always use the *Avalanche Rescue Quick Reference* (Figure 1 and located inside the back cover of your *Fieldbook*) when practicing rescue just as you would in the field.

The process for small-team avalanche rescue should be executed the same way every time. It is important for each backcountry team member to understand how to execute each of the following steps with confidence.

☐ **STOP. ASSESS SAFETY!** **ENSURE NO FURTHER HAZARD**

When the emergency first occurs, take a moment to assess the scene. Consider the terrain and resources at hand and decide how your party will best be able to effect a fast rescue and contact outside resources.

Before rushing to act, consult with the team to evaluate any remaining avalanche hazard. Is there still unstable snow above the crown of the avalanche? Are there cliffs or crevasses below the team? Your team should also determine and verbalize where it is safe for rescuers and survivors to enter the avalanche area and begin the search.

☐ **CHOOSE A LEADER**

Designating a leader helps prioritize tasks and minimize confusion. A leader's role is to delegate duties, consult the checklist while others execute tasks, and take a bird's eye view of the overall process.

☐ **HEAD COUNT**

Determine how many people are missing or unaccounted for and communicate that to the entire rescue party. This will cut down on confusion, particularly when other rescuers arrive.

If there are multiple victims, determine how you will use your resources. The harsh reality is that the team should prioritize the closest buried victim to make at least one rescue. Don't attempt to save everyone and fail to save anyone.

When traveling in avalanche terrain, only one person should be exposed to hazardous areas at a time to decrease the likelihood of a multiple-victim avalanche. In the unlikely event that multiple people are caught, however, concentrate your rescue efforts on the closest buried victim and then move on to the next one.

☐ **CALL FOR HELP**

Do not leave the site. While you are going to need help from outside resources, you are the first response and the best hope for rescuing your partner.

Determine how best to call for help (to other backcountry travelers, to 911, with a satellite device, or via VHF radio) based on your location. The rescue leader needs to make sure a member of the group immediately checks for a cell signal. Call for help via phone or radio before descending a slope, as you could lose the signal. Whatever communication device you have, take stock of the situation, make a note of your location, the nature of your emergency, the number in your group, and the number of people missing, injured, or buried. Take a moment to think about what you're going to say before calling or radioing for help. Speak clearly and communicate your information as soon as you have contact. You may be cut off or lose battery power, so make sure to explain you have an avalanche and/or medical emergency and your location.

☐ **SWITCH ALL TRANSCEIVERS TO SEARCH MODE**

The rescue leader or someone tasked with the job should visually verify all rescuers switch their transceivers to search mode. A panicked rescuer who leaves their transceiver in transmit can confuse a search and cost the team valuable minutes. If you are traveling with a new or inexperienced team member, it's worth double-checking their transceiver for them. The rescue leader should remind searchers to turn off cell phones, cameras, radios, and any other electronic devices (including electric gloves).

□ DETERMINE WHERE TO SEARCH

The rescue leader should determine where the buried victim(s) were last seen. The search starts from that Point down the avalanche path. Note any visual clues of where the victims might be and modify your search based on what you can see and common sense. The leader should communicate a search strategy based on resources, number of burials, and terrain features. Searchers should be sure to cover terrain traps, including piles of debris and the areas uphill of trees or rocks.

□ SEARCH FOR SIGNAL AND VISUAL CLUES

Rescuers should enter debris from the side or bottom of the avalanche to minimize exposure. The leader or whoever is in charge of the transceiver search must make sure the team searches methodically in 40m (130ft) wide search strips. See the diagrams in Figure 2, noticing the different search patterns for a lone searcher versus multiple searchers. Rescuers should clearly communicate if they see visual clues (poles, backpacks, gloves, or even a hand or ski sticking out of the snow).

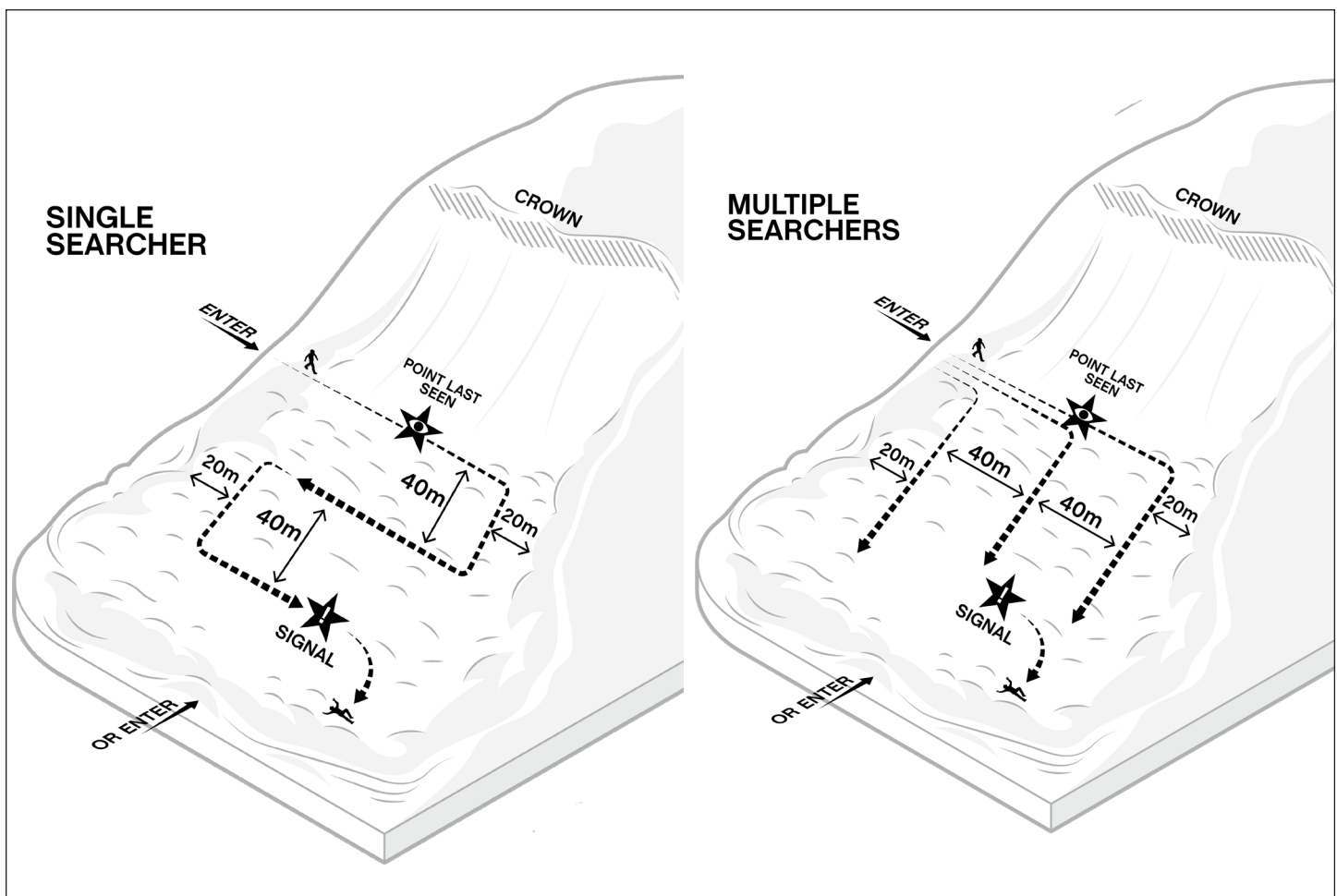


FIGURE 2: SINGLE AND MULTIPLE SIGNAL SEARCH PATTERNS

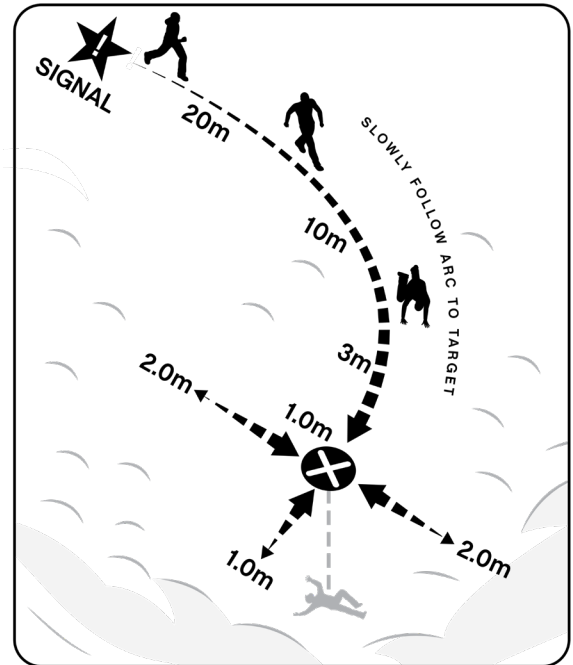
☐ YELL TO OTHERS WHEN YOU FIND A CLUE OR RECEIVE A SIGNAL

Avoid superfluous talk or shouting, but when you see or find a visual clue, and/or get a regular signal on their transceiver, yell to the team and let them know. Physical clues should be pulled out of the snow and left on the surface. The first rescuer to receive a regular signal should put a marker of some sort (a ski pole is perfect) in the snow to indicate where the signal search began. Once a rescuer is following a transceiver signal, they should yell for others to assemble shovels and a probe.

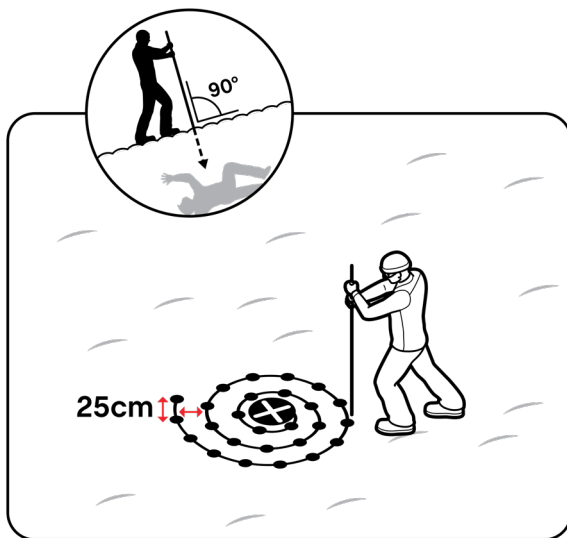
☐ FOLLOW THE TRANSCEIVER SIGNAL TO THE BURIAL AREA

Rescuers should move quickly, following their transceiver's arrow indications and watching the distance units decrease steadily until it drops below 10. Under 10, the rescuers should slow down and check their incoming paths towards the victim. Usually the incoming line will be a curved arc, based upon how the transceiver searches. Occasionally the line may be straighter depending on how the victim is oriented.

When the units drop below 5, the searcher should step out of their skis, snowboard, or snowshoes, leaving them directly in line with their final trajectory, as a physical marker that points towards the victims location. If resources allow for someone to probe ahead of the transceiver search, the rescuer with the transceiver should direct the rescuer probing. The searcher's transceiver should remain along the snow surface and oriented in the same direction for the remainder of the search. Rotating it will change the distance readings and confuse the search.



☐ LOCATE BURIAL WITH TRANSCEIVER AND PROBE



The transceiver searcher moves along the snow surface until their numbers begin to go up. At this point, mark the snow and without rotating or turning their transceiver, move backwards along the same line until the numbers go up again. At this point, the rescuer marks the point at which the transceiver displayed the lowest distance. Then, assemble the probe and begin probing in an outward spiral at 25cm (10in) intervals.

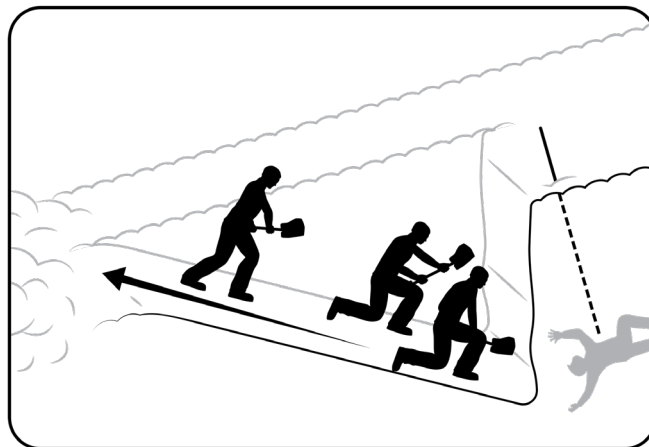
When multiple rescuers are present, the person who isn't conducting a transceiver search can assemble their probe and shovel. Once the transceiver searcher is slowing down on "final approach," the prober can get ahead of that person along the final approach trajectory and begin probing ahead of the transceiver searcher. This is called "pinpointing on a line." A well-practiced team can often get a probe strike in this way, saving valuable seconds in the rescue.

When you strike the victim with your probe, leave it in the snow and begin shoveling.

☐ SHOVEL FAST AND EFFECTIVELY

If a larger rescue team is on hand, other rescuers should assemble their shovels as the transceiver searcher and prober finish their tasks. Do not leave skis, packs, or other equipment downhill of the probe—these items will be buried and lost when the shoveling begins, which will only create more problems for the team as the rescue continues.

If the probe strike is less than 1m (3ft) deep, shovelers take one step downhill and begin digging towards the victim. If the victim is buried deeper than 1m, shovelers take two steps downhill and dig straight down and then inwards towards the victim. With three or more shovelers, two should be in the front, with additional shovelers moving snow downhill.



Shoveling as a team saves energy and time. The team should rotate out the two primary shovelers in front at 75–90 second intervals. Shovelers in the rear may choose to convert their shovels into hoe mode, if applicable. This speeds up clearing shoveled snow. As soon as rescuers reach the victim, care should be given to not injure the victim with shovels, and the victim's airway should be cleared immediately.

☐ PATIENT CARE

The patient's airway takes precedence over other issues. As soon as snow is cleared from the victim's face and their airway cleared, rescuers with first aid or medical training should check the patient, providing first aid and CPR as necessary. The victim will likely need medical attention for serious injuries sustained in the avalanche. If in exposed terrain, the team should move the patient to a safe zone, away from avalanche and weather hazards. Meanwhile, the rescue leader should plan an evacuation and coordinate with outside resources if possible. If you want to be fully prepared for an injury in the backcountry, consider investing in a commercial rescue sled or learning how to build a stretcher out of ski equipment.

☐ IF A HELICOPTER COMES TO YOUR AID

The team should prepare a landing zone, if possible, by removing any loose debris and instructing team members to secure personal packs and clothing. Protect the patient from blowing snow when the helicopter arrives. Don't approach the helicopter until instructed to do so by the pilot.

HOW TO CARE FOR AND EVACUATE AN INJURED PARTY

Once you've excavated a buried victim and ensured your patient has a clear airway, is breathing, and has a pulse, your team still has a serious medical and logistical issue to deal with. Patient care is first and foremost. Ensure the patient is treated for or protected against hypothermia and other environmental threats and then perform a complete head to toe physical assessment for injuries. If you don't have adequate first aid training, take a wilderness first aid course from a reputable provider in your area. Consider the first aid training and skills of you and your partners when *Assembling Your Group*. Just as you practice your rescue skills regularly, keep your skills sharp and up to date through regular training.

You may have sought out the backcountry for the solitude and remote lines. The reality of what this means, however, can be terrifyingly clear when having to move an injured party to a place where you can meet professional rescuers. Even if a helicopter can come to your aid, you may need to move the patient to a suitable location. At a minimum, carry enough equipment and know how to assemble an improvised litter or buy a commercial sled or tarp. Refresh your skills by practicing assembling it each season.

While you won't learn first aid or evacuation skills on an AIARE course, these skills are just as important as avalanche rescue skills. What you would do after you've excavated a fully buried victim should be considered every time you practice avalanche rescue. It's important to consider these additional required skills and equipment both when you *Assemble Your Group* and *Discuss Your Emergency Plan*.



Jeff Moskowitz

PRACTICE AND EVALUATE YOUR SKILLS

Rescue skills are a last resort when everything else goes wrong. Hopefully they are skills you rarely or never have to employ. But skills that aren't used expire. In order to master and maintain the skills necessary to execute a fast, efficient rescue, you need to practice avalanche rescue regularly.

At the beginning of each season and then monthly throughout the winter, *Practice a Rescue Response* with a team. Pre-event rehearsal is a proven strategy to reduce stress and focus on actions during critical, lifesaving situations. Practice not just avalanche rescue, but also review what to do if you are caught and the skills required to evacuate an injured person from the backcountry. Always practice with the *Avalanche Rescue Quick Reference*. How you practice is how you will respond in an emergency.



Joseph Osterman

The Rescue Practice Checklist is a tool designed to help you ensure you and your partners are practicing correctly and not building bad habits. It is used during an AIARE Avalanche Rescue Course and is included at the end of this section for reference. Have a partner use it when you practice to give you feedback to ensure you are creating the right habits instead of reinforcing poor skills.



Ben Mirkin

Use *The Practice Checklist* to debrief each scenario. Identify what you are doing well so you continue to do it. Identify where you would like to improve the next time you practice. Create practice strategies that target specific skills. Consider videoing your team's response and reviewing it together, identifying moments of confusion and places for improvement.

Another critical piece of evaluating your rescue skills is to time your response from the moment the team begins its search to the moment you've extracted a transceiver and turned it off. Your group should strive to extract two buried transceivers, both 1m (3ft) deep, in less than 10 minutes.



Hailey Littleton

Why is the time component so critical? The quicker you can rescue the avalanche victim, the better their chances of survival. While the probability of survival is 80% for those buried for 10 minutes, the probability drops to 40% after 15 minutes and then 10% after 35 minutes. In North America, these probabilities of survival in an avalanche are further reduced by the increased incidence of major trauma. Minutes can make the difference between life and death. Timed practice helps your team measure the improvements in speed and efficiency, so you can feel confident you are responding as quickly as possible.³

³ Haegeli, P. et al. "Comparison of Avalanche Survival Patterns in Canada and Switzerland." Canadian Medical Association Journal 183.7 (2011): 789–795. Crossref. Web. DOI:10.1503 /cmaj.101435

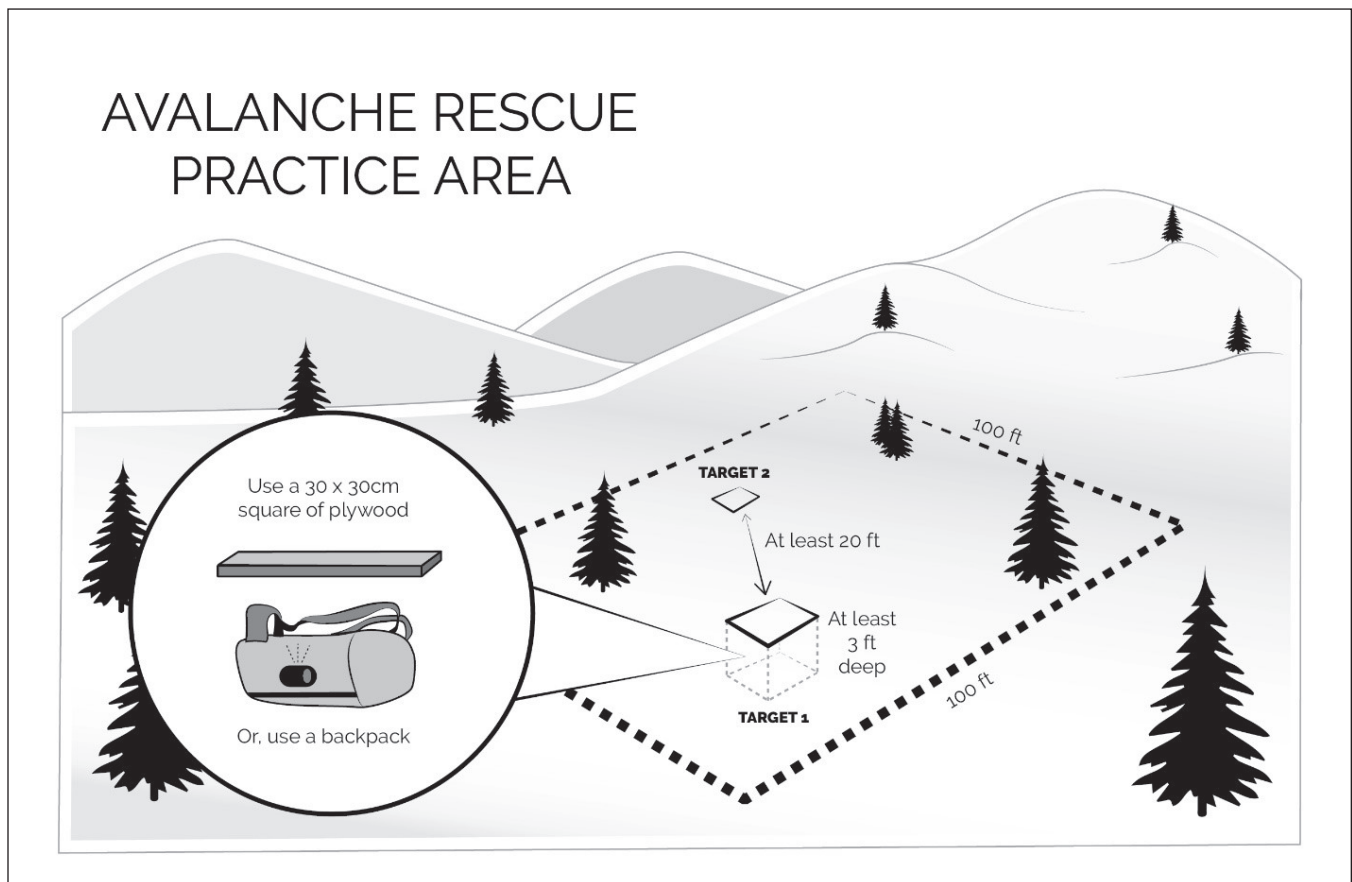
How to Practice Small Team Avalanche Rescue

Imagine the gut-wrenching emotions of helplessly watching and avalanche engulf a loved one as they rag doll over a convex roll and out of sight.. It's a gruesome worst-case scenario, but one where in order to offer the best possible chance of a good outcomes we've got to stop, think, and step into action decisively, without making another mistake.

Perfect practice makes perfect performance. Pre-event rehearsal is a proven strategy to reduce stress and improve competence in completely critical life-saving actions in sequence. It is not just practicing but also how you practice that will improve your skills.

Set up your practice area in a realistic scenario; not a parking lot or flat snow slope, but an area with varied terrain and deep snow that is safe from avalanches. Choose a tracked-up area free of noise and electrical interference like power lines, buildings, or other permanent infrastructure.

Start by burying just one transceiver in a 30 x 30m (100 x 100ft) area, at a minimum of 1m (3ft) deep—this is the average burial depth of an avalanche victim. You can put a 30 x 30cm (12 x 12in) square of plywood over the transceiver to give you a larger target and to protect the transceiver from probe strikes.



As your skills improve, bury two transceivers approximately 6m (20ft) apart. Practice using your transceiver to find each target on your own as well as in teams. Having two buried targets requires a systematic, calm approach to differentiate the signals. Make sure to bury the transceivers at least 1m (3ft) deep, as this facilitates realistic probing and shoveling practice.

Practice with your backcountry partners, rotating tasks and sharing responsibilities. Always use the *Avalanche Rescue Quick Reference* in *The Fieldbook*. Have one member of the team observe and use *The Rescue Practice Checklist* (at the end of this Chapter). Communicate clearly amongst teammates while practicing, clearly verbalizing what each member is doing. This will translate into clear, calm communications in the event of a real emergency, and this will save valuable minutes in the field.

**Rescue skills
have an
expiration
date.**

While rescue is only a backup plan for when everything goes wrong, you want to make sure that you can quickly and competently perform a rescue under stress. In order to do this:

- Practice avalanche rescue with your team regularly.
- Use *The Rescue Practice Checklist*. Time your practice.
- Acquire and maintain the additional skills required to provide first aid and extricate the injured party from the backcountry.
- Take an Avalanche Rescue Course regularly.



Avalanche Rescue Practice Checklist

Name: _____ Time: _____

ASSESS SAFETY

- ☐ Rescuer verbalized assessing exposure to a second avalanche
- ☐ Rescuer defined a safe location for spotters and survivors

CHOOSE A LEADER

- ☐ Rescuer verbalized assigning a leader or took charge and delegated tasks

HEAD COUNT

- ☐ Rescuer asked for and communicated number of victims to rescue party
- ☐ (Multiple Burial) Rescuer verbalized basic strategy for multiple victims

CALL FOR HELP

- ☐ Rescuer verbalized when to call for help, selected method of communication, and communicated appropriate information (at a minimum location and that an avalanche involvement has occurred)

SWITCH ALL TRANSCEIVERS TO SEARCH MODE

- ☐ Rescuer asked group to turn off electronic devices and turn transceivers to search mode

DETERMINE WHERE TO SEARCH

- ☐ Rescuer determined where to begin searching based on point last seen
- ☐ Rescuer communicated search strategy based on resources, number of burials, terrain features present, location of debris, etc.

Comments on Initial Avalanche Response:

SEARCH FOR SIGNAL & VISUAL CLUES

- ☐ Rescuer used a pattern (not greater than 40 m search strips) appropriate to mode and direction of travel to search debris, entering from the side or the toe, while moving quickly
- ☐ Rescuer looked for visual clues (or delegated the task) while searching for a signal

YELL TO OTHERS WHEN FINDING CLUE OR SIGNAL

- ☐ Rescuer pulled clues out of the snow and left it on the snow surface
- ☐ Rescuer left a marker on the snow when beginning to follow a signal
- ☐ Rescuer notified rescue party when finding visual clues or a signal
- ☐ Rescuer called for a second searcher to assemble probe (and shovel)

FOLLOW SIGNAL TO (1ST) BURIAL AREA

- ☐ Rescuer slowed down while approaching 10 m ensuring an assistant with probe accompanied search
- ☐ Rescuer communicated to allocate all team resources (including prober) at burial site
- ☐ Rescuer placed a marker on the snow or removed skis/board to visualize trajectory at 5 m
- ☐ Rescuer moved slowly and directed assistant to effectively probe ahead

Comments on Signal and Visual Clues Search:

LOCATE BURIAL WITH TRANSCIEVER

- ☐ Rescuer used an appropriate and efficient method (bracketing and/or probing in front of searching transceiver) to locate the closest signal
- ☐ Rescuer kept transceiver as close to the snow surface as possible while locating the closest signal
- ☐ Rescuer maintained consistent transceiver orientation while locating the closest signal
- ☐ Rescuer moves slowly enough to allow their transceiver to correctly process signals

Comments on Transceiver Search:**LOCATE BURIAL WITH PROBE**

- ☐ Rescuer used a consistent probing method (on a line or pinpointing with square or spiral pattern) with spacing no more than 25 cm
- ☐ Rescuer probed perpendicular to the debris surface
- ☐ Rescuer left probe in place on probe strike

SHOVEL FAST AND EFFECTIVELY

- ☐ Rescuer used probe to identify and verbalize depth of burial
- ☐ Rescuer moved appropriate distance downhill from probe to begin shoveling
- ☐ Rescuer used appropriate shoveling configuration based on number of available rescuers
- ☐ Rescuer dug a ramp towards the victim throwing snow far away
- ☐ Rescuer changed shovelers often (if possible)
- ☐ Rescuer shoveled carefully when nearing the victim

Comments on Probing and Shoveling:**(MULTIPLE BURIAL) LOCATE 2ND BURIAL WITH TRANSCIEVER**

- ☐ Rescuer switched 1st buried transceiver to search
- ☐ Rescuer intentionally moved away from 1st burial towards marked point of multiple transceiver signals.
- ☐ Rescuer uses repeatable method to detect 2nd transceiver signal (marking, micro-strip, 3-circle, etc) if needed.
- ☐ Rescuer repeated steps from "Follow signal to burial area" through "Shovel fast and effectively" for 2nd burial

Comments on Locating and Extracting 2nd Burial:**PATIENT CARE**

- ☐ Rescuer verbalized clearing patient airway and assessing need for CPR
- ☐ Rescuer defined safe location to move patient and rescuers
- ☐ Rescuer formulated evacuation plan based on available resources

CALL FOR HELP

- ☐ If complete call for help was not made initially, rescuer revisited call for help, selected method of communication, and communicated appropriate information

IF A HELICOPTER COMES TO YOUR AID

- ☐ Rescuer verbalized securing loose items and waiting for helicopter to land and rescuer to come to them

Comments on Post-Extraction:



Avalanche Rescue Practice Checklist

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- ☐ Rescuer verbalized assessing exposure to a second avalanche
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- ☐ Rescuer verbalized assigning a leader or took charge and delegated tasks

HEAD COUNT

- ☐ Rescuer asked for and communicated number of victims to rescue party
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